CLAIMS

1. A collimator (33, 55, 58) panel comprising:

a solid panel (35, 57, 60) having a first face for receiving uncollimated radiation and a second opposite face for providing collimated radiation; and

a plurality of elongate particles (37, 50) disposed in the panel and orientated to provide the collimating function.

2. The collimator panel of claim 1, wherein the longitudinal axes of the particles are orientated in a parallel configuration.

3. The collimator panel of claim 2, wherein the particles absorb visible light.

4. The collimator panel of claim 2, wherein the particles reflect visible and infrared light.

5. The collimator panel of claim 1, wherein the longitudinal axes of the particles are orientated in a converging configuration.

6. The collimator panel of claim 5, wherein the longitudinal axes of the particles converge to a point at a fixed distance from the collimator plate.

7. The collimator panel of claim 5, wherein the longitudinal axes of different groups of particles converge at points at different distances from the collimator plate.

8. The collimator panel of any one of claims 5 to 7, wherein the surfaces of the particles reflect visible light.

9. The collimator panel of claim 8, wherein the particles are metallic particles or dielectric multi-layer particles.

10. The collimator panel of any one of the preceding claims, wherein the solid panel is translucent.

11. The collimator panel of any one of claims 5 to 7, wherein the particles absorb X-ray radiation.

12. The collimator panel of claim 11, wherein the particles are lead particles, lead alloy particles or tungsten particles.

13. The collimator panel of claim 11 or 12, wherein the solid panel is radiolucent.

14. The collimator panel of any one of the preceding claims, wherein the ratio between thickness and length of the particles is at least 1:10.

15. The collimator panel of any one of the preceding claims, wherein the thickness of the particles is in the range 5nm to 1μm and the length of the particles is in the range 1μm to 100μm.

16. The collimator panel of any one of the preceding claims, wherein the solid panel comprises a cured polymerisable liquid.

17. The collimator panel of any one of claims 1 to 15, wherein the solid panel comprises an organic material having a solidifying temperature above 40°C.

18. A display device comprising the collimator panel of claim 2 or 3.

19. A backlight (41, 49) for a transmissive liquid crystal display device (47) comprising the collimator panel of any one of claims 8 to 10.

20. An X-ray detector comprising the collimator panel of any one of claims 11 to 13.

21. A collimator panel array (41) comprising a plurality of collimator panels according to any of the preceding claims.

22. A method of manufacturing a collimator panel, the method comprising the steps of:
suspending a plurality of elongate particles in a liquid;
applying an electric or magnetic field to the suspension to orientate the particles; and
solidifying the liquid to fix the orientation of the particles, thereby forming a collimator panel.

23. The method of claim 22, further comprising the step of bringing the suspension between contoured surfaces (93) prior to the step of applying an electric or magnetic field.

24. The method of claim 23, further comprising the step of flattening the collimator panel after the step of solidifying the liquid.

25. The method of claims 22, further comprising the step of bringing the suspension between flat parallel surfaces prior to the step of applying an electric or magnetic field.

26. The method of any one of claims 22 to 25, wherein the step of applying an electric or magnetic field comprises applying an electric or magnetic field having parallel field lines.

27. The method of any one of claims 22 to 25, wherein the step of applying an electric or magnetic field comprises applying an electric or magnetic field having non-parallel field lines.

28. The method of any one of claims 22 to 27, wherein the liquid comprises a polymerisable liquid, and the step of solidifying the liquid comprises polymerising the liquid.

29. The method of any one of claims 22 to 27, wherein the liquid comprises an organic material having a solidifying temperature above 40°C, and the step of solidifying the liquid comprises cooling the liquid.

30. The method of claim 28, wherein the step of polymerising the liquid comprises exposing the liquid to ultraviolet light to initiate a polymerisation reaction.

31. The method of claim 28, wherein the polymerisable liquid comprises a (metha)acrylate, an epoxy, a vinylether monomer or a thiolene system.

32. A method of manufacturing elongate particles (69) for suspending in panels, the method comprising the steps of:

depositing a patterned layer of negative etch resist material (61) on a layer of elongate particle material (63), patterned areas representing a required shape and size of a plurality of elongate particles (69); and

etching areas of the layer of elongate particle material not covered by the negative etch resist material, thereby leaving elongate particles.

33. The method of claim 32, wherein the layer of elongate particle material is disposed on a substrate (67) coated with a release layer (65), and wherein the method further comprises, after the step of etching, the step of releasing the elongate particles from the substrate.

34. The method of claim 33, wherein the step of releasing the elongate particles from the substrate comprises dissolving the release layer in a solvent.

35. The method of any one of claims 32 to 34, further comprising, after the step of etching, the step of removing the negative etch resist material from the elongate particle material.

36. The method of any one of claims 32 to 35, wherein the patterned layer of negative etch resist material is deposited by offset printing, microcontact printing or inkjet printing.

37. A method of manufacturing elongate particles for suspending in panels, the method comprising the steps of:

depositing a patterned layer of positive etch resist material on a layer of elongate particle material, unpatterned areas representing a required shape and size of a plurality of elongate particles;

processing the unpatterned areas to make them more etch resistant than the patterned areas; and

removing the positive etch resist material and etching areas of the layer of elongate particle material that were covered by the positive etch resist material, thereby leaving elongate particles.

38. The method of claim 37, wherein the layer of elongate particle material is disposed on a substrate coated with a release layer, and wherein the method further comprises, after the step of removing the positive etch resist material and etching, the step of releasing the elongate particles from the substrate.

39. The method of claim 38, wherein the step of releasing the elongate particles from the substrate comprises dissolving the release layer in a solvent.

40. The method of any one of claims 37 to 39, wherein the patterned layer of positive etch resist material is deposited by offset printing, microcontact printing or inkjet printing.

41. The method of any one of claims 22 to 31, preceded by the method of any one of claims 32 to 40.